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10/580,609	05/25/2006	Kohachi Tsuji	1207-133	4986
23117 7590 04/01/2010 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
WATTS, ALAN B				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/580,609

**Applicant(s)**

TSUJI ET AL.

**Examiner**

ALAN B. WAITS

**Art Unit**

3656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 January 2010.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 12-22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 12-22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is written in generally narrative form making it unclear which elements/steps are being positively recited and which should be given patentable weight. The examiner suggests rewriting the claims in accordance with 37 CFR 1.75(i) so as to make clear what elements/steps are being positively recited and what should be given patentable weight. As written the claims are confusing and it is unclear which limitations belong together. For example, the limitation "having a radius of curvature" could be referencing the first circular arc surface, the cylindrical bush or r1 and r2 in the claim.

Claim 1 also recites the limitation "the annular end face". Perhaps the claim should read --the annular end face--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "a bush bearing". Claim 1 then further recites "an aluminum-made housing". This newly added amendment to the claim renders the scope of the claim unclear. It is unclear if Applicant is trying to claim just the bush

bearing, or the combination of the bush bearing and the housing. For the purpose of examination, the examiner assumes that Applicant is not claiming the combination, but simply the bush bearing. The limitation regarding the "aluminum-made housing" is therefore regarded as intended use and given little or no patentable weight.

The term "small" in claim 1 is a relative term which renders the claim indefinite. The term "small" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiuga JP 59-212508 in view of Yanase USP 6548188 and in further view of Sakamki USP 4561835.

Hiuga disclose a similar device comprising:

**Re clm 1**

- A cylindrical bush bearing (fig 3) whose inner peripheral surface is a sliding surface (3, fig 1)
- An outer peripheral surface of the bush bearing has a cylindrical surface (fig 3)

- A tapered surface (6, fig 1) interposed between the cylindrical surface and at least one annular axial end face (right end, fig 3) of the bush bearing
- A difference  $\delta (=r_1 - r_2)$  between a radius  $r_1$  of the bush bearing at the cylindrical surface of the bush bearing and a radius  $r_2$  of the one annular end face at an outer peripheral edge of the one annular end face (fig 1)

Hiuga does not explicitly disclose:

- A difference  $\delta (=r_1 - r_2)$  between a radius  $r_1$  of the bush bearing at the cylindrical surface of the bush bearing and a radius  $r_2$  of the one annular end face at an outer peripheral edge of the one annular end face is in a range of not less than  $0.1t$  and not more than  $0.3t$ , where  $t$  is a wall thickness of the bush bearing at the cylindrical surface of the bush bearing

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga and provide:

- A difference  $\delta (=r_1 - r_2)$  between a radius  $r_1$  of the bush bearing at the cylindrical surface of the bush bearing and a radius  $r_2$  of the one annular end face at an outer peripheral edge of the one annular end face is in a range of not less than  $0.1t$  and not more than  $0.3t$ , where  $t$  is a wall thickness of the bush bearing at the cylindrical surface of the bush bearing

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Hiuga further discloses:

- The tapered surface extends in an axial direction (to the left, fig 3) continuously from the one annular end face
- The cylindrical surface extends continuously in the axial direction from the tapered surface toward another axial end face (left end, fig 3) of the bush bearing
- The bush bearing being constituted by a wrapped bush bearing in which a plate (1, fig 1) having the sliding surface on one surface thereof is convoluted into a cylindrical shape such that the sliding surface is positioned on the inner peripheral side (fig 3)
- An angle of intersection,  $\theta$ , between the tapered surface and an axial line being not less than  $15^\circ$  and not more than  $25^\circ$  (pg 50, col 1, ln 24)

Hiuga does not disclose

- The plate being constituted by a multilayered plate which includes a back plate entirely coated with copper
- A porous sintered metal layer adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin with which the porous sintered metal layer is impregnated, which has self-lubricity and wear resistance

Yanase teaches:

- The plate being constituted by a multilayered plate (fig 1) which includes a back plate (1, fig 1) entirely coated with copper (col 5, ln 48-52)

- A porous sintered metal layer (2, fig 1) adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin (3, fig 1) with which the porous sintered metal layer is impregnated, which has self-lubricity and wear resistance

for the purpose of providing a bearing capable of exhibiting a stable low friction coefficient and an extremely low wear amount under dry frictional condition (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga and provide:

- The plate being constituted by a multilayered plate which includes a back plate entirely coated with copper
- A porous sintered metal layer adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin with which the porous sintered metal layer is impregnated, which has self-lubricity and wear resistance

as taught by Yanase, for the purpose of providing a bearing capable of exhibiting a stable low friction coefficient and an extremely low wear amount under dry frictional condition.

Hiuga in view of Yanase further disclose:

- The cylindrical surface, the tapered surface and the on annular end face being constituted by an exposed surface of the copper coating layer (fig 3, Hiuga; col 5 ln 48-52, Yanase)

Hiuga in view of Yanase does not disclose:

- A first smooth circular arc surface being interposed between the tapered surface and the cylindrical surface
- A second smooth circular arc surface being interposed between the tapered surface and the one annular end face

Sakamaki teaches smoothing outer edges of a bearing bush (36, fig 5) for the purpose of preventing large shear stress discontinuity caused by sharp corners.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Yanase and provide:

- A first smooth circular arc surface being interposed between the tapered surface and the cylindrical surface
- A second smooth circular arc surface being interposed between the tapered surface and the one annular end face

for the purpose of preventing large shear stress discontinuity caused by sharp corners.

Sakamki does not disclose:

- a radius of curvature (of the first smooth arc surface) which is not less than 0.1 mm and not more than 1.0 mm
- a radius of curvature (of the second smooth arc surface) which is not less than 0.1 and not more than 0.5 mm

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Yanase and in further view of Sakamki to provide:



- a radius of curvature (of the first smooth arc surface) which is not less than 0.1 mm and not more than 1.0 mm
- a radius of curvature (of the second smooth arc surface) which is not less than 0.1 and not more than 0.5 mm

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

The examiner notes that the limitation "the outer peripheral edge of the annular end face having a small diameter compared to a diameter of a hole of an aluminum-made housing in which the bush bearing is press fitted" is considered to be outside the intended scope of the claims and therefore given little or no patentable weight.

**Re clm 12 and 21**

- the tapered surface is formed by roll forming

With regards to the limitation above, the patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

**Re clm 13, Hiuga further discloses**

- the peripheral surface of the bush bearing further has, in addition to the tapered surface interposed between the cylindrical surface and the one annular end face, another tapered surface (left side, fig 3) interposed between the cylindrical surface and the other annular axial end face of the bush bearing

**Re clm 14**, Hiuga further discloses

- the other tapered surface extends in the axial direction continuously from the other annular end face (fig 3)
- the cylindrical surface extends in the axial direction from the other tapered surface toward the one axial end face of the bush bearing (fig 3)

**Re clm 15**, Hiuga further discloses

- the other tapered surface extends in the axial direction between the cylindrical surface and the other annular end face so as to be flat or convex toward the outside (fig 3)

**Re clm 16-19**

- see claim 1 rejection above regarding Sakamaki.

**Re clm 20**

- An angle of intersection,  $\theta$ , between the other tapered surface and the axial line being not less than  $15^\circ$  and not more than  $25^\circ$  (pg 50, col 1, ln 24)

**Re clm 22**, Hiuga in view of Yanase further discloses:

- The other tapered surface is constituted by an exposed surface of the copper coating layer (fig 3, Hiuga; col 5 ln 48-52, Yanase)

***Response to Arguments***

6. Applicant's arguments with respect to claims 1 and 12-22 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claims 13-22 above, the examiner notes that since Hiuga discloses a symmetrical bearing element in fig 3, any modifications done to the one side of the bearing (claim 1) would also be done to the other side (claims 13-22) in order to maintain symmetry.

Regarding Applicants arguments involving *In re Aller*, Applicant argues that the examiner failed to conduct an analysis to establish the general conditions of what is disclosed in the prior art. The examiner disagrees with this assertion. The examiner clearly pointed out the general conditions of what is claimed in the prior art via the rejection. The examiner notes that every limitation is disclosed in the prior art of record used in the rejection except the numerical ranges involved.

Although Applicant's example regarding the angle is no longer relevant given the new grounds of rejection, the examiner notes that in the case of the difference in  $r_1$  and  $r_2$ , the general conditions of what is disclosed in the prior art is clearly detailed in the rejection above. The examiner points out that there is indeed a difference in  $r_1$  and  $r_2$  shown in the prior art (fig 1 and 3 of Hiuga). Since the general condition of what is claimed (a difference in  $r_1$  and  $r_2$ ) is disclosed, it is the examiner's opinion that a *prima facie* case of obviousness has been established.

Regarding the radius of curvatures, the examiner notes that Sakamaki clearly discloses "the roundness [of the edges] extends over the entire edge of the rotar sleeve" (col 3, ln 66-68). Therefore, the general condition of what is claimed (a radius of curvature on edges) is disclosed.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ALAN B. WAITS** whose telephone number is (571)270-3664. The examiner can normally be reached on **Monday through Friday 7:30 am to 5 pm EST**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard Ridley** can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan B Waits/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656